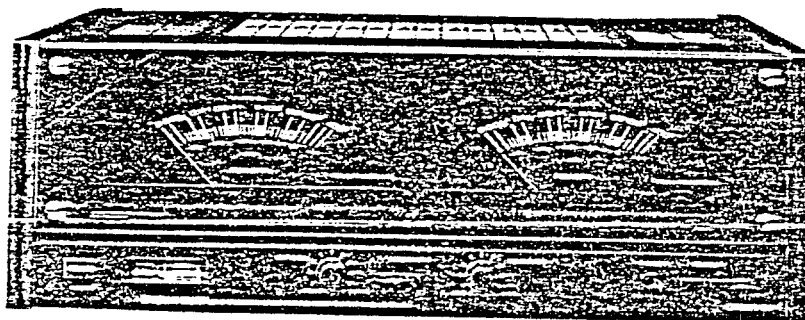


ONKYO SERVICE MANUAL

SUPER SERVO STEREO
POWER AMPLIFIER**M-506RS**

UW	120V / 220V AC, 50 / 60 Hz
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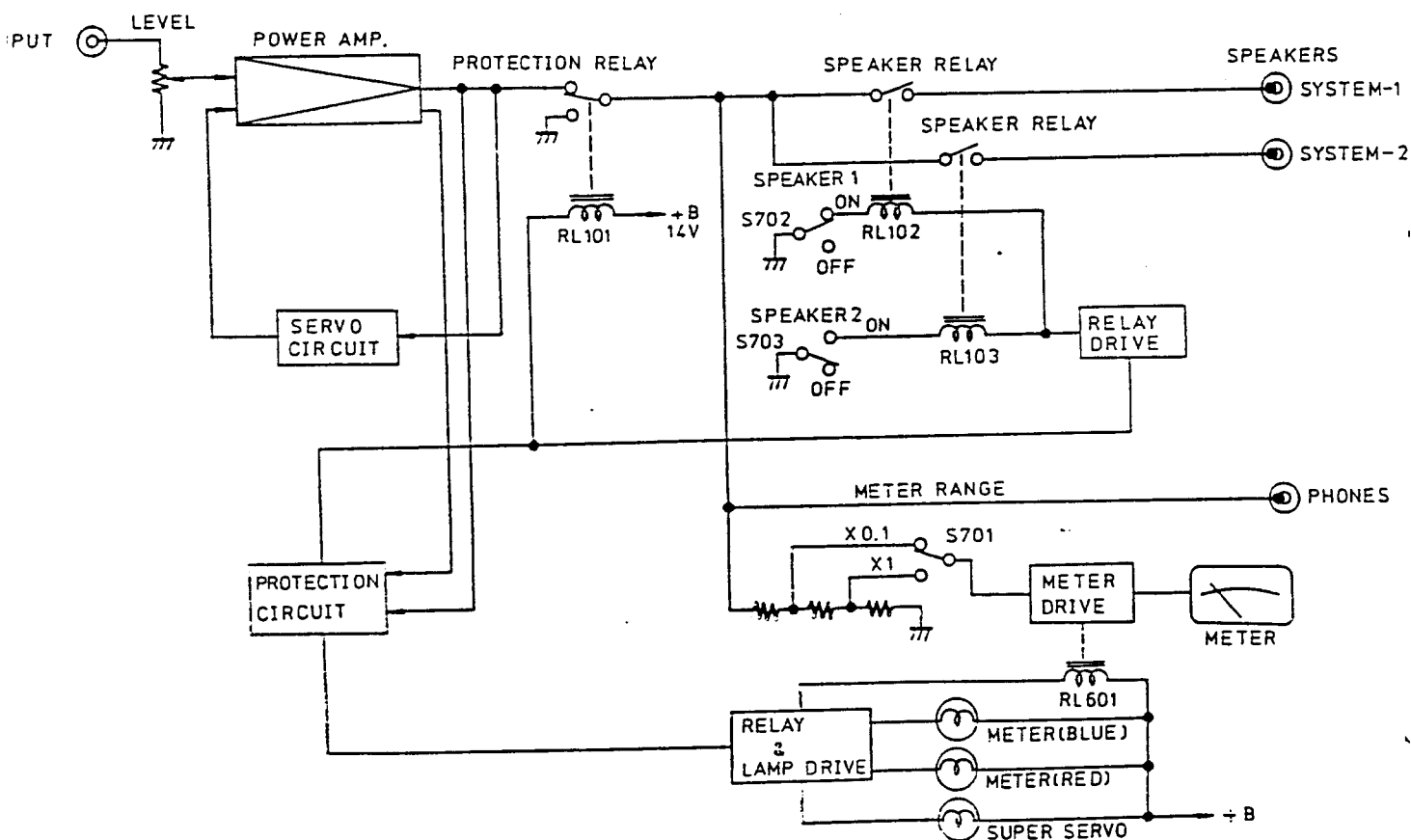
ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Power output:	150 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.002% total harmonic distortion
Total harmonic distortion:	0.002% at rated power 0.002% at 1 watt output
Intermodulation distortion:	0.0015% at rated power
Frequency response:	1 Hz to 100 kHz, +0, -1.5dB
Input sensitivity:	1 volt
Input impedance:	47 kohms
Damping factor:	180 (8 ohms, 1 kHz)
S/N ratio:	122 dB
Power supply:	AC120V, 60Hz or AC220V, 50Hz
Outputs:	SPEAKERS 1 & 2, PHONES
Inputs:	INPUT
Semiconductors:	8 FETs, 47 transistors, 54 diodes, 6 ICs
Dimensions:	480(W) x 175(H) x 422(D) mm 18 7/8" x 6 7/8" x 16 5/8"
Weight:	20.5 kg, 45.2 lbs.

Specifications and features are subject to change without notice.

BLOCK DIAGRAM



PRECAUTIONS

1. Replacing the fuse

For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
F101,F102	252102	6A-TL, Primary fuse
F103,F104	252076	3.15-SE-EAK, Primary fuse
F121,F122	252062	TLC-1A, Secondary fuse

2. Replacing the lamp

This unit uses the lamp listed below.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL701	210094	PL14V60mA-3.0
PL702,PL703	210086	PL14V60mA-0.9
PL704		
PL705	210138	PL14V0.08A-1.5
PL801,PL802	210160	PL14V150mA, Blue
PL803,PL804	210089	PL14V150mA, Red

3. Insulation resistance measurement

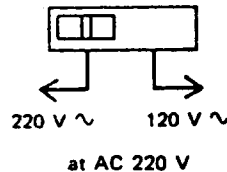
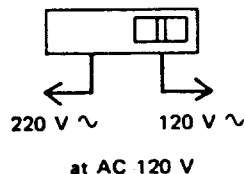
Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel.

Specification; 500V more than 10 MΩ

4. Voltage selector (rear panel)

The M-506RS is equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

Voltage is changed by sliding the groove in the switch with a screwdriver or similar instrument to right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.



ADJUSTMENTS

Check of Adjustments and Protective Circuitry

1. Idling Current Adjustment

(1) Preparations

- a. Place the unit on the work bench so that there is a gap of about 15mm between the bottom of the unit and the bench.
- b. With no load or signal, set the level to minimum.
- c. Be sure the unit is not exposed to a draft since this can cause unstable instrument readings.

- (2) Remove the large cover and rotate semi-fixed resistor ~~R428~~ ^{R441 R542} (R528) fully counterclockwise and semi-fixed resistor R433 (R533) fully clockwise (both resistors are on the NAMA-1781 board). Then switch the power on.

- (3) Adjust semi-fixed resistor ~~R428~~ ^{R441 R542} (R528) so that the voltage between test points VCT and IID of the NAMA-1781 circuit board is about 10mV (DC) three minutes after power is switched on and 14mV five minutes after power is switched on.

2. Distortion Adjustment

- (1) Connect a noninductive resistor (8 ohms) to the L and R channels of speaker terminals 1.
- (2) Connect a distortion meter and a voltmeter to the load resistance.

(3) Using a low frequency oscillator, apply a signal to the INPUT terminals at 20kHz so that the voltage at both ends of the load resistor is 10V.

(4) Adjust semi-fixed resistor R433 (R533) of the NAMA-1871 board so that distortion is minimized.

3. Meter Adjustment

(1) Preparations

- a. There should be no load.
- b. Apply a 1kHz signal to the INPUT terminals.
- c. Set the meter range to x0.1.
- d. Set semi-fixed resistors R639 (R640) and R611 (R612) of the NAME-1786 board to the center positions.

(2) Meter Zero-Point Adjustment

With power switched off, rotate the zero-point adjustment screw so that the pointer is aligned with the zero line.

Note: Do not perform this procedure immediately after power has been switched off; wait until the meter circuitry has been completely discharged.

(3) Meter Offset Adjustment

Switch power on, and after about five minutes (no input signal), adjust semi-fixed resistor R639 (R640) of the NAME-1786 board so that the pointer is aligned with the zero line. (Perform an approximate adjustment after power is switched on.)

(4) Meter Level Adjustment

Apply a 1kHz signal to the L channel INPUT terminal and attenuate the signal until the voltage at the speaker OUTPUT terminal becomes 10.2V (20.17dBf). Then adjust the meter level adjustment semi-fixed resistor R611 (R612) of the NAME-1786 board so that the pointer is aligned with the 0dB line.

4. Operation Check of Protective Circuitry

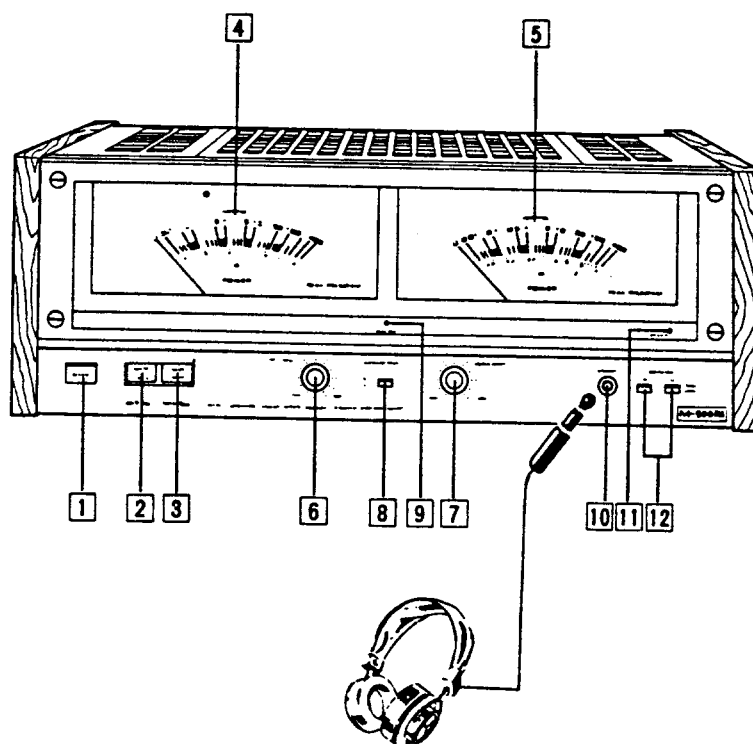
Speaker Level Muting Operation

- a. About three to six seconds after switching power on, confirm that relay RL101 of the NAPS-1782 board switches on. Until the relay switches on, the meter pointers should not move even if an input signal exists. At this time, the meter should be illuminated in red by PL803 and PL804 (PL903 and PL904) and the SERVO lamp (PL705) should not be on.
- b. When the relay switches on, signal input to the meters should instantly begin causing the meter pointers to move. The meter should now be illuminated in blue by PL801 and PL802 (PL901 and PL902) and the SERVO lamp should light.
- c. When power is switched off, all relays should be immediately switched off and no output signal be produced.

Note 1: Items in parentheses are for the R channel.

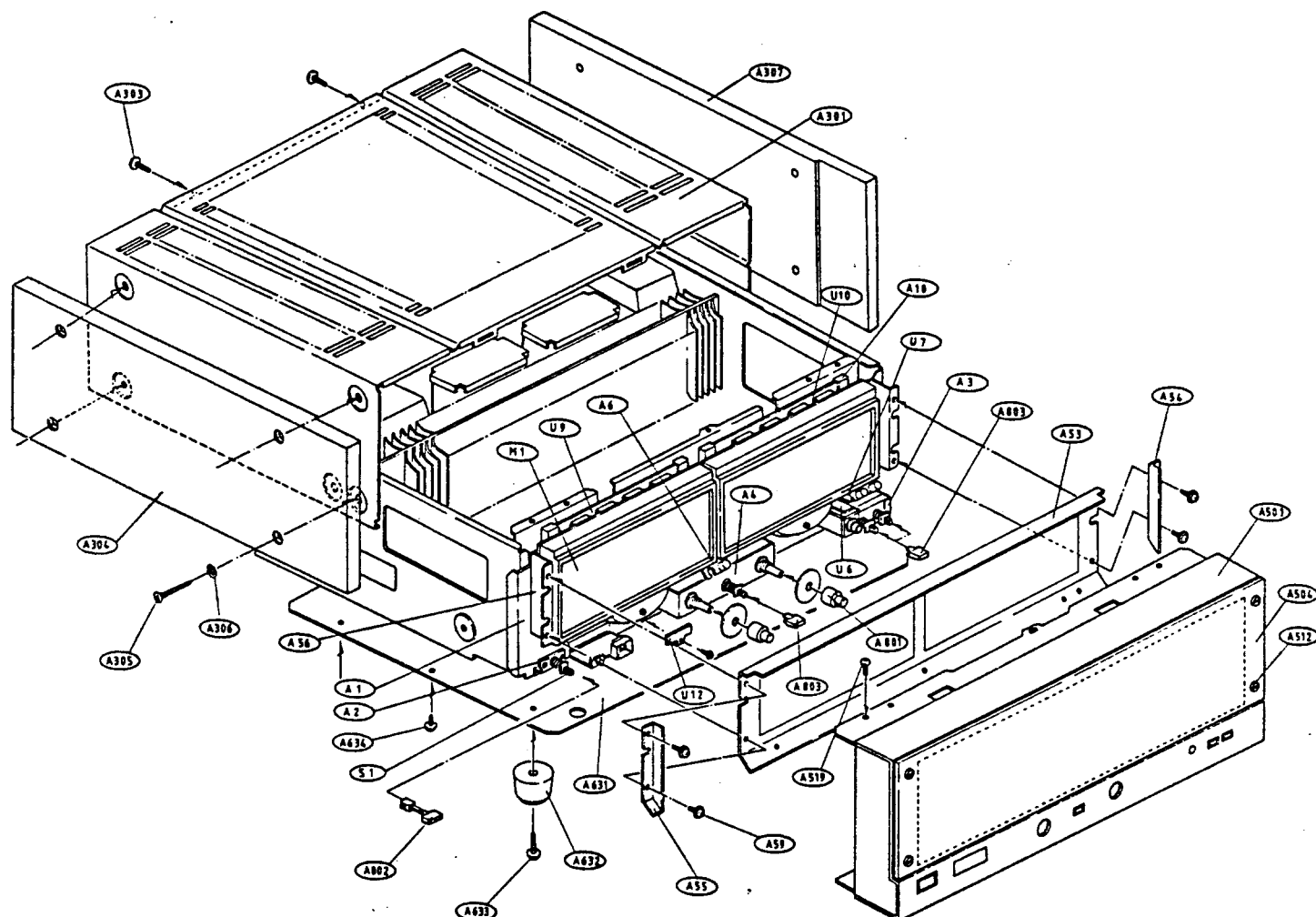
Note 2: If the protective circuitry operates, the speaker relays are held for a few seconds and remain off even after the cause of the problem has been corrected. To reset the relays, the power must be left off for a few seconds.

FRONT PANEL



1. Power switch
2. Power indicator
3. Super servo indicator
4. Left channel power meter
5. Right channel power meter
6. Left channel level control
7. Right channel level control
8. Meter range selector
9. Meter range selector indicator
10. Headphones jack
11. Speaker indicators
12. Speaker selectors

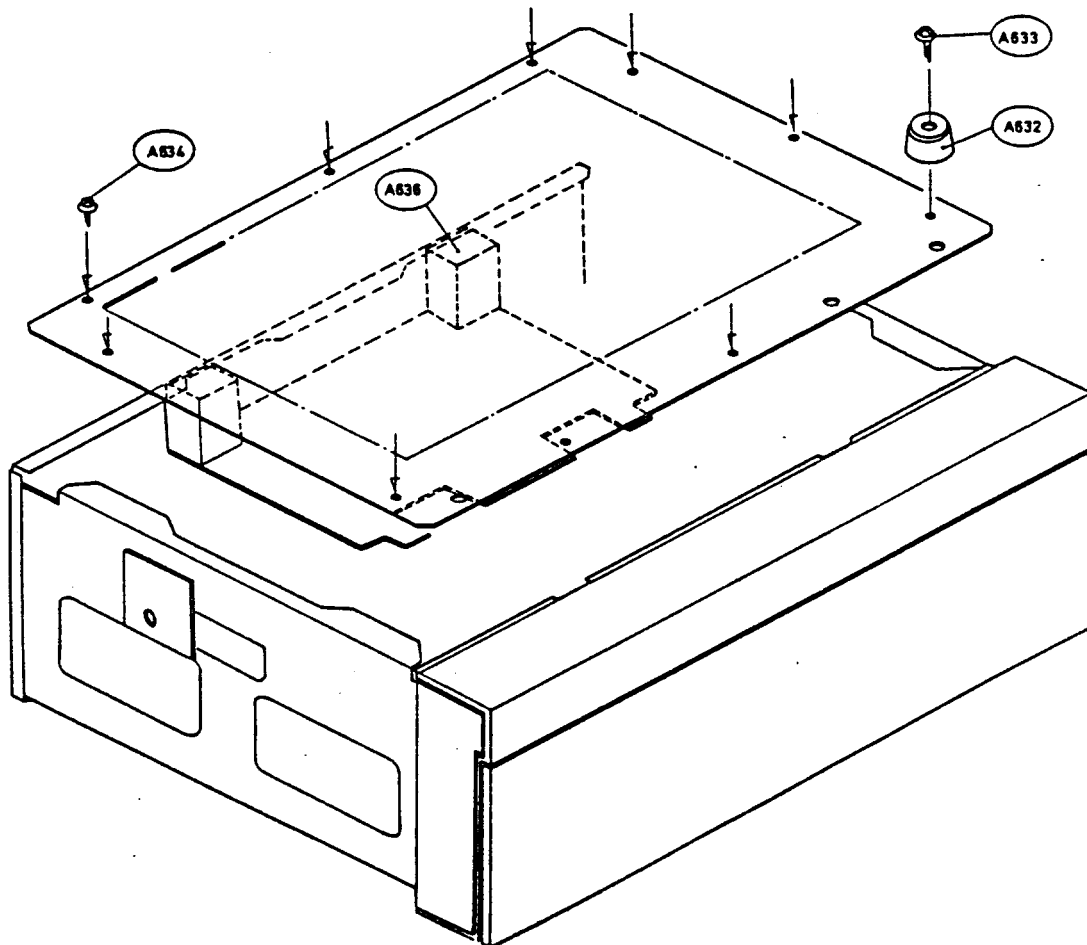
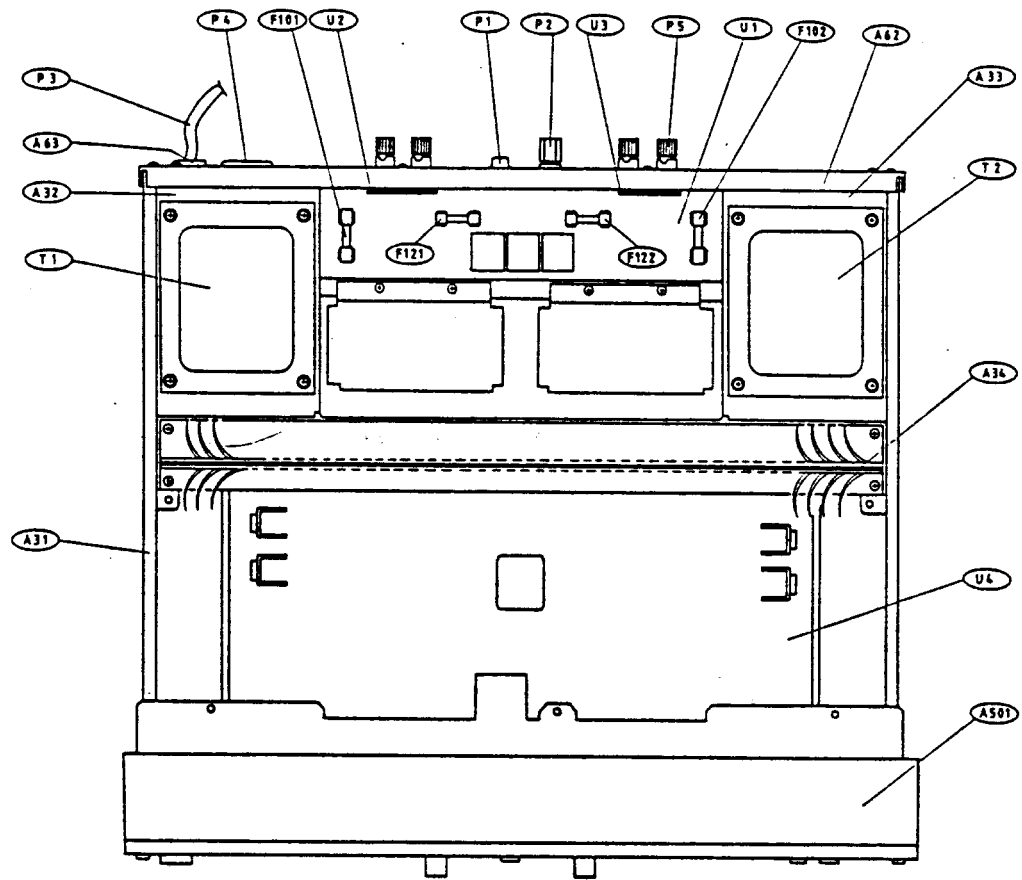
EXPLODED VIEW



M-506RS PARTS LIST

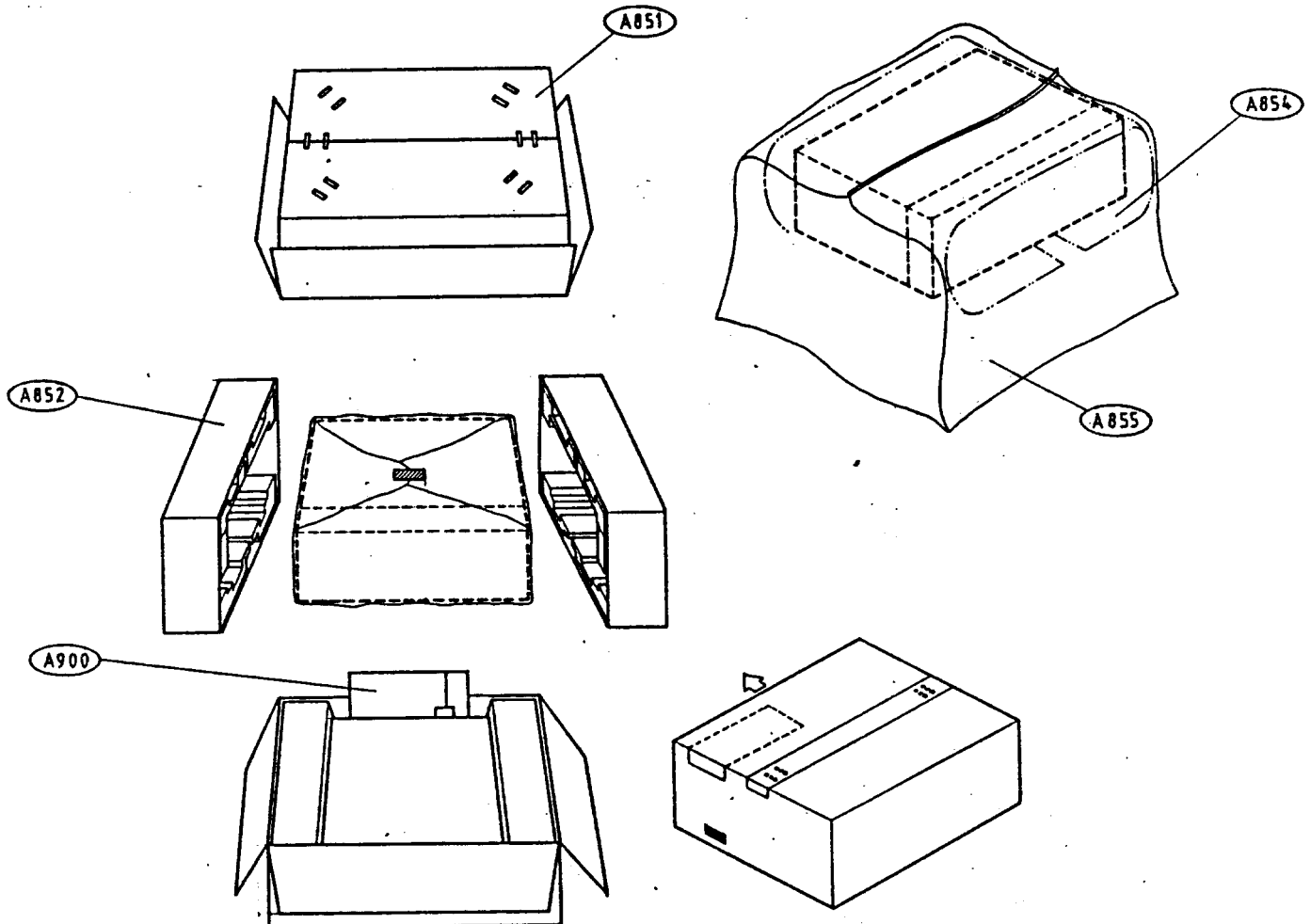
REF. NO.	PARTS NO.	DESCRIPTION
A1	27110149B	Front bracket
A2	27140816A	Bracket, Power switch
A3	27140550A	Bracket, Headphone
A4	27140551A	Bracket, Volume
A6	27140317	Bracket, Lamp
A10	27115053C	Holder, PC board
A31	27115053C	Side bracket
A32	27130172A	Bracket, Transformer, Left
A33	27130173A	Bracket, Transformer, Right
A34	27160148A	Radiator
A53	28133107	Plate
A54	28125096B	End cap, Right
A55	28125097B	End cap, Left
A56	27140555	Bracket
A59	831430088	3TTW+8B(BC), Tapping screw

COMPONENT LOCATION



A62	27120631	Back panel
A63	270280	SR-4K-4, Strainrelief
A301	28184246	Top cover
A303	838440089	4TTB+8C(BC), Tapping screw
A304	28185191	Side board, Left
A305	836440303	4STV+30CQ(BC), Screw
A306	870086	4 x 12BC(BC), Special washer
A307	28185202	Side board, Right
A501	12741121	Front panel ass'y
A504	28191098	Clear plate
A512	27300348	Screw
	27270017B	Spacer
	86214010	WN4 x 10FN, Nut
	870105	t1.5 x ϕ 10 x ϕ 4 mm, Washer
	870054A	t1.5 x ϕ 10 x ϕ 6 mm, Washer
A519	834430068	3TTS+6B(BC), Tapping screw
A631	27170067	Bottom board
A632	280889B	Bottom leg
A633	831430168	3TTW+16B(BC), Tapping screw
A634	831430088	3TTW+8B(BC), Tapping screw
A636	28140447	32 x 20 x 15 mm, Cushion
A801	28320633	Knob, Volume
A802	28321247A	Knob, Power switch
A803	28320645A	Knob, Push switch
Q413,Q513	2211255	2SC1815(GR), Transistors
Q416,Q417	2201372 or	2SC3280(R) or
Q516,Q517	2201373	2SC3280(O), Transistors
Q418,Q419	2201362 or	2SA1301(R) or
Q518,Q519	2201363	2SA1301(O), Transistors
D404,D504	4000068	VD1222, Diodes
T1,T2	230830	NPT-821DG, Power transformers
F101,F102	252102	6A-TL, Primary fuse
F103,F104	252076	3.15A-SE-EAK, Primary fuse
F121,F122	252062	TLC-1A, Secondary fuse
C1,C2,C3	3500065A	0.01 μ F, AC400V, Capacitor IS
C1a,C2a,C3a	27300601	SB-1925, Cover, Capacitor for C1
R1,R2	5104112	N27D100KB25M, Variable resistor
S1	25035381	NPS-121-L345P, Power switch
S2	25065109	NSS-2255P, Voltage selector switch
S3	25065091A	IP-105A-95, Thermal switch
F1a	25050050	H0438A, Fuse holder
F2a	25065096	NPF-073, Fuse holder
P1	25045063	NPJ-2PRBL30, Input terminal
P2	TP160B-1	TP160B, Ground terminal
P3	253092-1	AS-CEE-2, Power supply cable
P5	25060084	NTM-4PRMN28, Speaker terminal
M1	243141	NIND-2000S141, Power meter
U1	12741582A	NAPS-1782a, Protector and rectifier circuit pc board ass'y
U2	12740583	NAOP-1783, Speaker terminal pc board ass'y
U3	12740584	NAOP-1784, Speaker terminal pc board ass'y
U4	12741580A	NAMA-1780a, Power amplifier pc board ass'y
U5	12740586	NAME-1786, Meter drive circuit pc board ass'y
U6	12740587	NAHP-1787, Headphone jack pc board ass'y
U7	12740588	NASW-1788, Meter range switch pc board ass'y
U8	12740589	NASW-1789, Speaker switch pc board ass'y
U9	12740590	NAPL-1790, Meter lamp pc board ass'y
U10	12740591	NAPL-1791, Meter lamp pc board ass'y
U11	12740518A	NATB-1818a, Turbo filter pc board ass'y
U12	12740592	NAPL-1792, Servo lamp pc board ass'y

M-506RS PACKING PROCEDURES



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A851	29050819	Master carton box
A852	29090884	Pad ass'y
A854	29095317	500 x 1200 mm, Protection sheet
A855	29100038A	720 x 950 mm, Poly bag
	29355060	Caution label
A900	Accessory bag ass'y	
	29340817	Instruction manual
	29365012	Warranty card
	29358002B	Service station list
	2010069	Connection cable
	25055018	CV-K-1, Conversion plug
	29100006A	350 x 250 mm, Poly bag

M-506RS PRINTED CIRCUIT BOARD PARTS LIST

PROTECTOR AND RECTIFIER CIRCUIT PC BOARD (NAPS-1782a) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q101	222584	TA7317P
	Transistor	
Q102	2211504	2SA950(Y)
	Diodes	
D101~ D112	223841	GP30G
D113,D114	223862	WL01
D120	2240973	GZA6.2Z
D121,D123 ~ D125	223145	1S2076TD
D122	4000087	NV022D10
	Coils	
L101,L102	231016	S-0.8D
	Capacitors	
C101~ C104	3504179	22000 μ F, 69V, Elect.
C107,C108	379134735	0.047 μ F, 100V, DEW
C109,C110	352722219	220 μ F, 6.3V, Elect.
C113	352784799	0.47 μ F, 50V, Elect.
C114	352734719	470 μ F, 16V, Elect.
C115	352742229	2200 μ F, 16V, Elect.
C117	352732209	22 μ F, 10V, Elect.
	Resistors	
R101,R102	441620474	4.7 Ω , 1W, Metal oxide film
R107,R108	441721004	10 Ω , 2W, Metal oxide film
R121~ R124	441520334	3.3 Ω , 1/2W, Metal oxide film
	Relaies	
RL101 ~ RL103	25065036	NRL-4P3A-DC12-01
	Fuseholders	
F101a,F102a	250113	S-N5051
F121a,F122a		
F103a,F104a	25050065	YSH403T
	Plugs	
	25055114	NPLG-6P98
	Plates	
	27300605	Buss
	Brackets	
	27130334	
	27130342	
	Cushions	
	28140302	

SPEAKER TERMINAL PC BOARD (NAOP-1783) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	25060084	NTM-4PRMN28, Terminal

SPEAKER TERMINAL PC BOARD (NAOP-1784) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	25060084	NTM-4PRMN28, Terminal

POWER AMPLIFIER PC BOARD (NAMA-1780a) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q401,Q501	2211916 or	2SK240(BL)
	2211917	2SK240(V)
Q402~ Q404,Q407	2211255	2SC1815(GR)
Q502~ Q504,Q507		
Q405,Q505	2211140	2SA798(O-001)

Q406, Q506	2211446 or	2SC2291(G) or
	2211445	2SC2291(F)
Q408, Q508	2211455	2SA1015(GR)
Q409, Q509	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q410, Q420, Q510	2211792 or	2SA992(F) or
Q520	2211793	2SA992(E)
Q411, Q511	2211742 or	2SA915(L) or
	2211743	2SA915(M)
Q412, Q512	2211762 or	2SC1940(L) or
	2211763	2SC1940(M)
Q414, Q514	2200863 or	2SC2238(O) or
	2200864	2SC2238(Y)
Q415, Q515	2200873 or	2SA968(O) or
	2200874	2SA968(Y)
Q422, Q423, Q523	2211945 or	2SK246(GR) or
	2211315	2SK117(GR)
Q424, Q524	2200664	2SC1626(Y)
Q425, Q525	2200674	2SA816(Y)
	ICs	
Q421, Q521	222465	NJM4558D
	Diodes	
D401~ D406, D411	223145	1S2076TD
D501~ D506, D412		
D511, D512		
D407~ D410	2241191	GZA18X
D507~ D510		
	Capacitors	
C401, C501	372121514	150pF, 50V, ST
C402, C502	372122214	220pF, 50V, ST
C403, C503	379122235	0.022 μ F, 50V, DEW
C411, C412, C511	379121045	0.1 μ F, 50V, DEW
C512		
C413, C414, C426	379132247	0.22 μ F, 100V, DEW
C427, C513, C514		
C526, C527		
C417, C418, C517	352722219	220 μ F, 6.3V, Elect.
C518		
C419, C519	379221037	0.01 μ F, 50V, DEW
C422, C522	379122247	0.22 μ F, 50V, DEW
C423, C424, C523	379131047	0.1 μ F, 100V, DEW
C524		
C428, C429, C528	352754709	47 μ F, 25V, Elect.
C529		
C430, C431, C530	352751019	100 μ F, 25V, Elect.
C531		
C432, C433, C532	352752219	220 μ F, 25V, Elect.
C533		
C435, C535	379121235	0.012 μ F, 50V, DEW
	Resistors	
R431, R432, R531	441526804	68 Ω , 1/2W, Metal oxide film
R532		
R436, R536	441622724	2.7k Ω , 1W, Metal oxide film
R441, R541	5225074	N10HR10K8DM, Semi fixed
R445, R545	441521014	100 Ω , 1/2W, Metal oxide film
R446~ R449	441520224	2.2 Ω , 1/2W, Metal oxide film
R546~ R549		
R450, R451, R550	4000078	0.33 Ω , 5W, Metal plate
R551		

R454~ R457	4000080	0.47 Ω , 5W, Metal plate
R554~ R557		
R458, R459, R558	441620104	1 Ω , 1W, Metal oxide film
R559		
R460~ R463	441520684	6.8 Ω , 1/2W, Metal oxide film
R560~ R563		
R464, R465, R564	441525124	5.1k Ω , 1/2W, Metal oxide film
R565		
R469, R470, R569	441522214	220 Ω , 1/2W, Metal oxide film
R570		
R481, R482, R581	441626214	620 Ω , 1W, Metal oxide film
R582		

Radiators	
27160029	RAD-07
Plate	
27300461	Buss

METER DRIVE CIRCUIT PC BOARD (NAME-1786) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q603	222529	TA7318P(R)
Q606, Q607	222502	NJM4558DX
	Transistors	
Q601, Q602	2211945	2SK246(GR)
Q604, Q605	2211255	2SC1815(GR)
Q608	2200664	2SC1626(Y)
Q609	2200674	2SA816(Y)
Q611, Q612	2201286 or 2201285	2SD882(P) or 2SD882(Q)
	Diodes	
D601, D602, D609	223145	1S2076TD
D610, D611		
D603, D604, D606	2241151	GZA15X
D607, D608	2241233	GZA22Z
	Capacitors	
C601, C602	352784799	0.47 μ F, 50V, Elect.
C605, C606, C610	352780339	3.3 μ F, 50V, Elect.
C611		
C607	352780109	1 μ F, 50V, Elect.
C608, C609	379121035	0.01 μ , 50V, DEW
C612, C613, C618	352754709	47 μ F, 25V, Elect.
C619		
C614, C615	352752219	220 μ F, 25V, Elect.
	Resistors	
R611, R612	5221024	N10HR1KBEM, Semi fixed
R639, R640	5221023	N10HR470BEM, Semi fixed
R644	441523324	3.3k Ω , 1/2W, Metal oxide film
R645	441525124	5.1k Ω , 1/2W, Metal oxide film
R646, R647	441525614	560 Ω , 1/2W, Metal oxide film
R649	441623024	3k Ω , 1W, Metal oxide film
R652, R654	441524714	470 Ω , 1/2W, Metal oxide film
R657, R658	441723314	330 Ω , 2W, Metal oxide film
R659	441524704	47 Ω , 1/2W, Metal oxide film
R660	441720274	2.7 Ω , 2W, Metal oxide film
R661	441726894	0.68 Ω , 2W, Metal oxide film
	Relay	
RL601	25065048	FRL-644D12/2AS
	Sockets	
	2000247	NSAS-6P185

HEADPHONE JACK PC BOARD (NAHP-1787) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
P701	25045062	M1654-A, Stereo headphone jack

METER RANGE SWITCH PC BOARD (NASW-1788) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL701	210094	PL14V60mA-3.0, Lamp
PL704	210086	PL14V60mA-0.9, Lamp
R707, R708	4000028	D33A, Thermistor
R709, R710	441526204	62Ω, 1/2W, Metal oxide film resistors
S701	25035097	NPS-142-L62, Switch

SPEAKER SWITCH PC BOARD (NASW-1789) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL702, PL703	210086	PL14060mA-0.9, Lamps
R711, R712	441526204	62Ω, 1/2W, Metal oxide film resistors
S702, S703	25035165	NPS-222-L129, Switch

METER LAMPS PC BOARD (NAPL-1790, NAPL-1791) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL801, PL802, PL901	210160	PL14V150mA, Blue
PL902		
PL803, PL804, PL903	210089	PL14V150mA, Red
PL904	27140552	Bracket, Lamps

TURBO FILTER PC BOARD (NATB-1818a) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C51, C52	380503345	0.33μF, 160V, Capacitors, CF
C53	380504745	0.47μF, 160V, Capacitors, CF
R53	441526204	62Ω, 1/2W, Metal oxide film resistors
	27300609	Case

SERVO LAMP PC BOARD (NAPL-1792) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL705	210138	PL14V0.08AW-1.5, Lamp

